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THE SHORT-MOUTHED SNAKE (*EUTAINIA BRACHYSTOMA* COPE) IN SOUTHERN MICHIGAN.

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In 1892, Cope described, under the name *Eutainia brachystoma*, a small garter-snake from Franklin County, Pennsylvania, which had been sent to him in alcohol, the distinguishing feature being the small number of labial plates in both the upper and under jaws. Since the description was published no other specimens have been taken and the validity of the species has been openly questioned. It is therefore a matter of considerable interest that the species has been found in the vicinity of Olivet, Michigan, on several occasions, during the spring of 1903. The first specimens taken were a male and female collected April 20, beside a rail fence crossing an open but very wet pasture. The fence ran close beside a pool of water where there was a growth of willow and alder bushes, and it was under the shelter of these bushes that the snakes were found. On April 23, careful search in the same locality revealed a second female and April 29, another female was taken at the same spot. On May 7, still another female was captured beside the same fence but some sixty yards from the bushes. On May 12, a fifth female was taken in a very wet swamp on the margin of a lake, half a mile or more from the above mentioned pasture.

The following table will bring out clearly the characters of the species and the individual peculiarities of the Olivet specimens:

Number	Date	Sex	Length (mm.)	Gastrosteges	Urosteges	Upper Labials	Lower Labials	Postoculars
						R—L	R—L	R—L
Cope's type.	1892	♂	286	132	72	6—6	8—8	3—3
1	April 20, 1903	♂	472	135½	61	6—6	8—8	3—3
2	April 20	♀	556	133½	58	6—6	8—8	2—2
3	April 23	♀	485+	137	?	6—6	8—8	2—2
4	April 29	♀	420	136	52	6—6	8—9	2—3
5	May 7	♀	411	141	54	7—7	8—8	2—2
6	May 12	♀	460	140	58	6—6	8—8	3—3

It will be noticed at once that only one of the five females is perfectly normal, all of the others having a reduced number of postocular plates. It is also apparent that the type specimen is not an average representative of the species, since the number of gastrosteges is exceptionally small, while the number of urosteges is unusually large. In Nos. 1 and 2 there were incomplete gastrosteges, which have been counted as half plates. In No. 3, nearly one-half of the tail was missing, so that the urosteges could not be determined.

The new material makes it possible to state more definitely the specific characters, and to correct one or two of Cope's misstatements, which were due to his having only one specimen, and that an alcoholic. In general appearance, the short-mouthed snake is somewhat like the common garter snake (*Eutania sirtalis*) but the head is so much narrower and the tail tapers so much more abruptly that even a very casual glance will suffice to note the difference. In coloration, moreover, there is a very

striking difference between the two species, as indicated by Cope, but his description of the color of *brachystoma* is very misleading, owing to the changes produced by the alcohol. In life, *brachystoma* is very dark brown above, many of the scales being almost black, as are portions of the skin; in some specimens, when the skin is stretched, these black areas appear as a more or less complete double series of squarish spots on each side of the dorsal region; the mid-dorsal row of scales and the inner half of the scales in the row on each side of it are bright yellow anteriorly, gradually becoming duller posteriorly and losing their distinctness on the tail; a similar stripe occurs on each side of the body and includes all the scales of the third row, the lower half of most of those in the fourth row and the upper half of many in the second row; these lateral stripes fade away on the tail but are very bright anteriorly, where they expand so that the entire sides of the neck are very yellow; on this yellow area are several prominent black spots; the first row of scales and the outer ends of the gastrosteges are deep brown, the latter with a dusky yellowish tinge; the ventral surface is dull light olivaceous, darkest near vent, sparsely speckled with black (the exact shade varies considerably, No. 6 having the whole lower surface dark, becoming almost black in front of vent); there is a narrow black spot on the anterior margin of the outer end of the gastrosteges; the head is brown, with a greenish tinge anteriorly; labials yellow, chin white and throat yellowish; parietal spots yellow, very evident. Gastrosteges 132–141 (average 136+); urosteges 61–72 in ♂, 52–58 in ♀; upper labials 6; lower labials 8; postoculars 3; scale rows 19.

The question which naturally arises is: What is the relation of *brachystoma* to *sirtalis*? Had Cope's type remained unique, it might well have been regarded as a sport, merely an unusually aberrant *sirtalis*, and the discovery of a single specimen in Olivet or elsewhere would not necessarily have disproved the correctness of this view. But in the light of the evidence furnished by six specimens of both sexes, taken at various times in several places, such a view is certainly incorrect and there can be no doubt of the distinctness of the two species. The difference in color is constant, in spite of the extraordinary variety shown by *sirtalis*; in the latter the lateral stripes are mainly on the second, partly on the third, row of scales instead of on the

third and fourth as in *brachystoma*; while the deep brown band below these stripes is wanting in *sirtalis*. The difference in form is equally noticeable, though less easily stated; *brachystoma* is more stocky and tapers towards both ends rather abruptly. As regards the number and arrangement of scales, the two species are equally distinct, although individuals occur combining the characters curiously. Thus No. 5 has 7 upper labials on each side, the normal number for *sirtalis*, while No. 4 has 9 lower labials on the left side; out of 320 specimens of *sirtalis* examined this spring, 6 have 6 upper labials on one side but none have that number on both sides, while 12 have 8 upper labials on one side, and 2 have that number on both sides; as regards the lower labials, 268 of the 320 have the lower labials 10 on each side, 9 have 9 on each side, 4 have 11 on each side, and 2 have only 8 on each side, while the remainder have 9 or 11 on one side or the other, except 3 which have 8 on one side. The most interesting case in this connection is a small male *sirtalis*, which has the upper labials 6-7 and the lower 8-8; however, as it has 152 gastrosteges and 75 urosteges and is a perfectly normal *sirtalis* in coloration, it cannot be regarded as in any sense a connecting link with *brachystoma*. In the number of gastrosteges the difference between the two species is striking, *brachystoma* ranging from 132 to 141, with an average of about 136, while the 320 specimens of *sirtalis* range from 142 to 159 and average about 151; and it should be added that of the 320, only one has 142, two have 143, and two 144 gastrosteges. In the number of urosteges the two recorded male *brachystoma* are far apart, 61 and 72, an average of less than 67, but male *sirtalis* range from 64 to 79, with an average of more than 71, and further, only 9 of 163 specimens have less than 67 urosteges; the female *brachystoma* range from 52 to 58 with an average of more than 55, while female *sirtalis* range from 57 to 73, with an average of more than 63, and only 4 out of 157 have less than 59. Cope's statement that "the number of urosteges remains as in" *sirtalis* requires, therefore, some modification, as it is clear that the number is normally decidedly less than in the common garter-snake.

In regard to the habits of *brachystoma*, Cope's statement that "it is one of the forms \* \* \* which \* \* \* have adopted a terrestrial life and more or less burrowing habits" is

open to question. Though not aquatic, this species likes the water and has been found only in its immediate neighborhood. Several specimens have been kept alive, under as natural conditions as possible, and they show considerable readiness to take to the water when alarmed, nor is there any evidence of burrowing or of retreating to holes. Indeed the habits are very much like those of the common garter-snake, except that *brachystoma* is not at all pugnacious, making no attempt to strike when seized or handled.